Jet Structure Topical Group status

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sPHENIX General Meeting

Recent developments

- 16 August 2016, https://indico.bnl.gov/conferenceDisplay.py?confId=2330

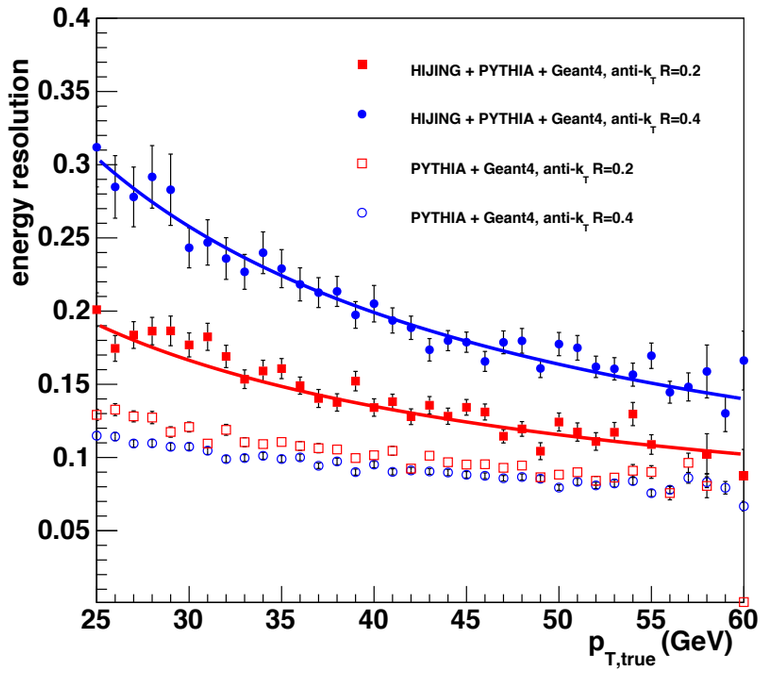
  ➡ Megan Connors (GSU/RIKEN), plans for updated jet performance studies

  ➡ Justin Frantz (Ohio) & group, development of EMCal clustering tools

- Jet Structure TG wiki page: https://wiki.bnl.gov/sPHENIX/index.php/Jet_Structure_Topical_Group

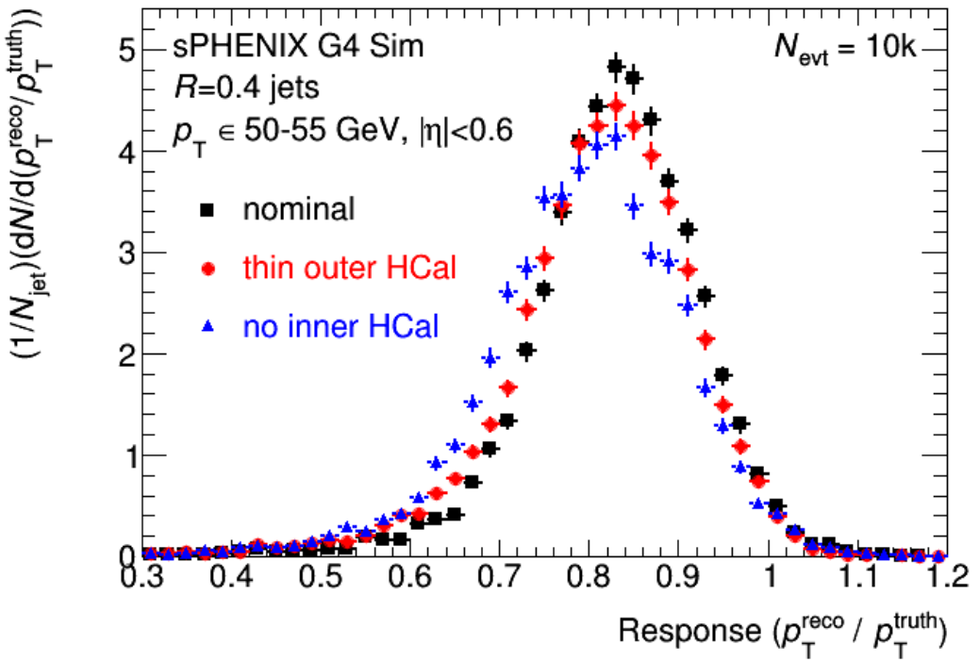
  ➡ currently blank, but idea is to use it to document knowledge/results

Jet performance plans



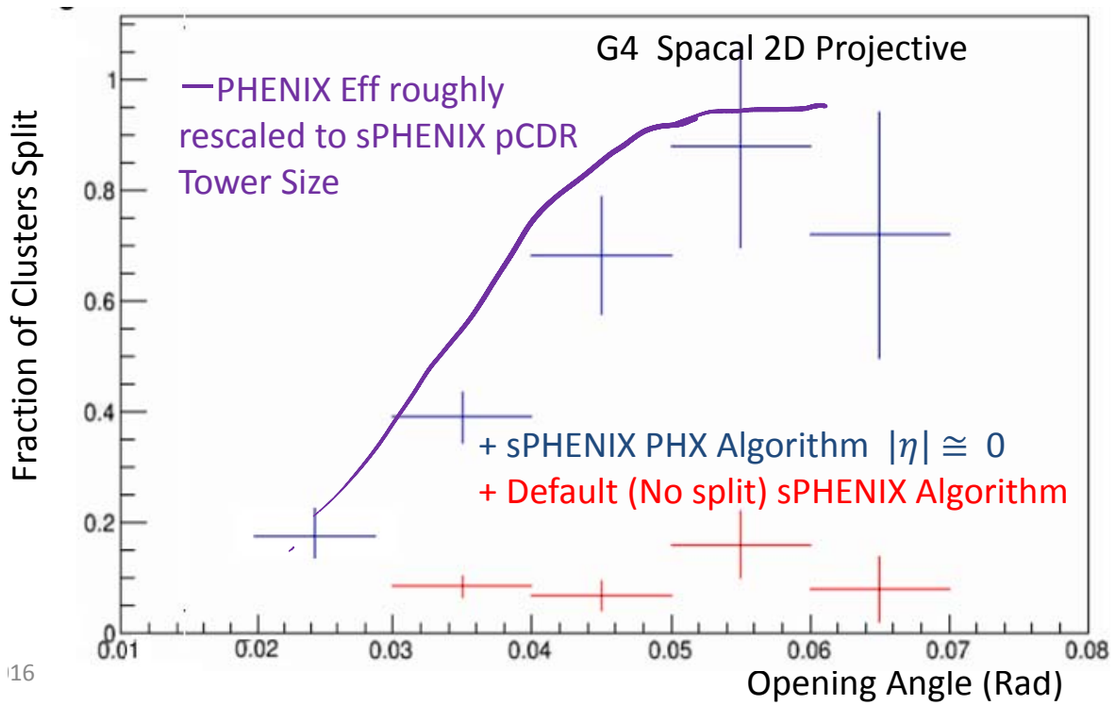
MIE plot

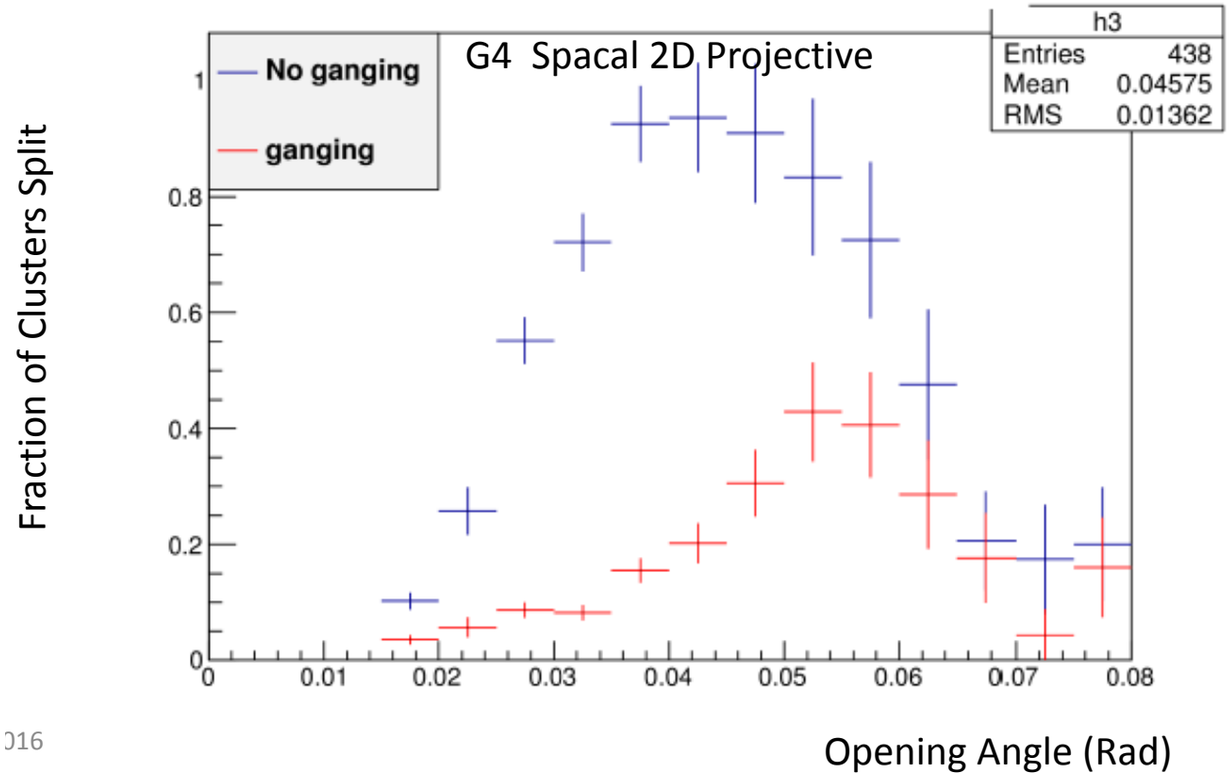
latest simulation software



- Megan: Plan is to produce framework which makes a systematic determination of the performance in various ways
  - ➡ e.g. JES/JER for inclusive calo jets vs. anti-k_t cone size, Hijing impact parameter, jet η / p_T
  - ➡ discussed software and MC needs
- Results to be documented in semi-regular fashion in a Jet Structure area on the sPHENIX Wiki
  - ➡ performance vs. “time”, vs. various configurations

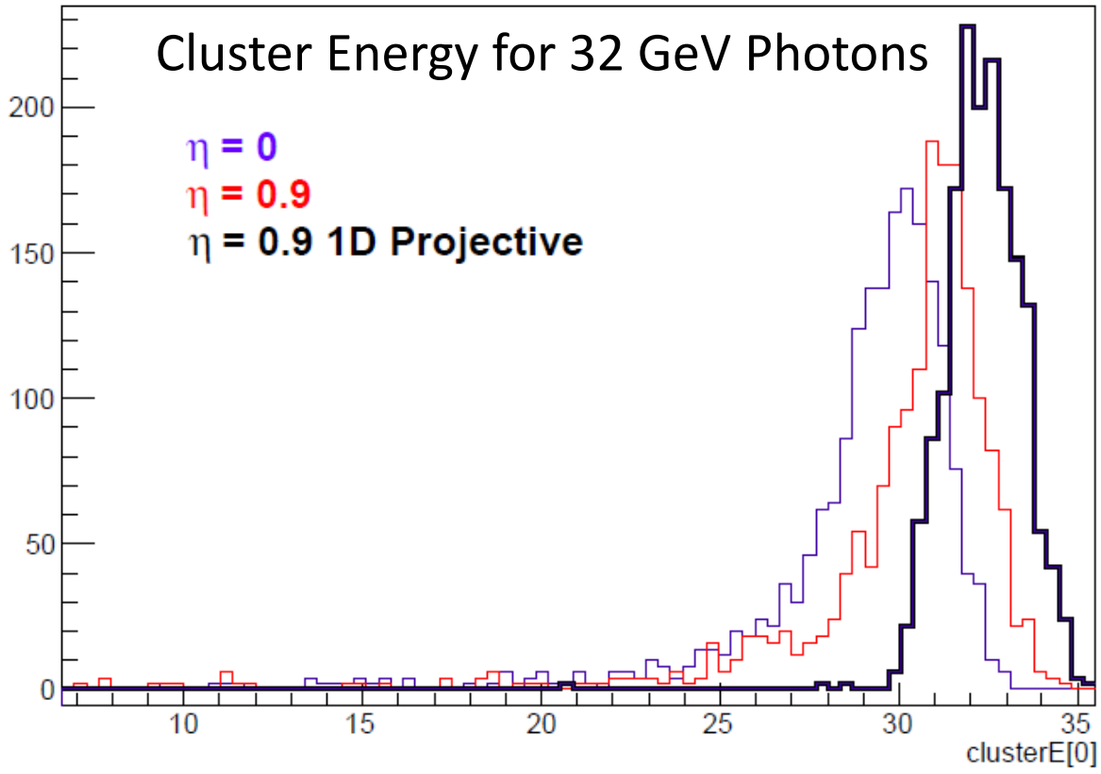
EMCal clustering

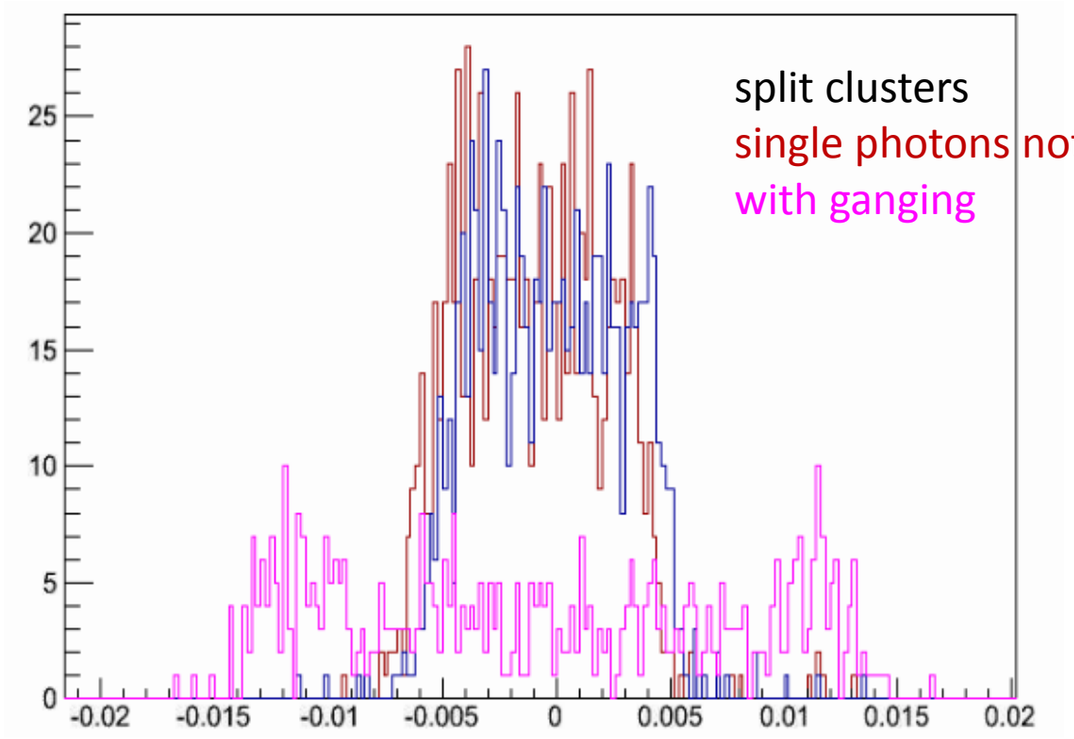




- Justin: work ongoing to port PHENIX clustering to sPHENIX
  - ➡ (*c.f.* CMS-style "Island algorithm" being implemented by Brandon, default "geometric association" sPHENIX algorithm)
  - ➡ developing tools to test and optimize performance
- Particular focus is ability to split clusters from π^0 decays
  - ➡ with/without 2x2 tower ganging, 1D vs. 2D projective, at small/large-η, etc.

EMCal clustering





Truth phi – Cluster phi

- Various other aspects being explored:
  - ➡ *left*: measured energy for fixed-*E* truth photons (still trying to understand some of the features here)
  - ➡ *right*: position resolution under various configurations (largest sensitivity is to presence/absence of ganging)
- Good progress overall, with several items identified for future work

Tracking review

- Plan has been to run our previously generated dijet HepMC files through calorimeter-less G4 simulation
  - ➡ MAPS+TPC option, with comparisons to MIE configuration (7-layer large-livearea silicon) also available
- Main deliverable: investigate efficiency & resolution (and purity given the presence of fake tracks) inside jet cone
  - ➡ *i.e.* as would be most useful for FF measurement
  - ➡ do first for *p*+*p*, then with Hijing embedding if possible
- Group has been slow to identify manpower and begin simulations & analysis effort toward this goal
  - ➡ reached out to Simulations team (Jin) earlier this week to make sure I understand current status of simulations & software
  - ➡ attempting to present a first look by sPHENIX Simulations meeting on Tuesday, 22 August